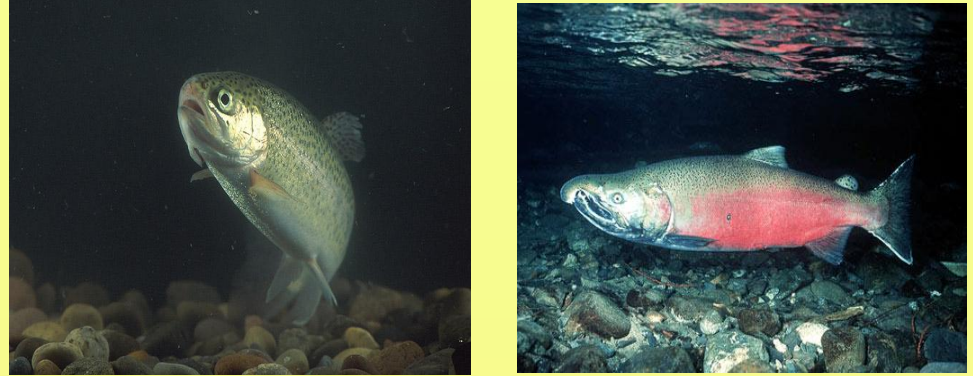


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## Cold Water West Coast Fish

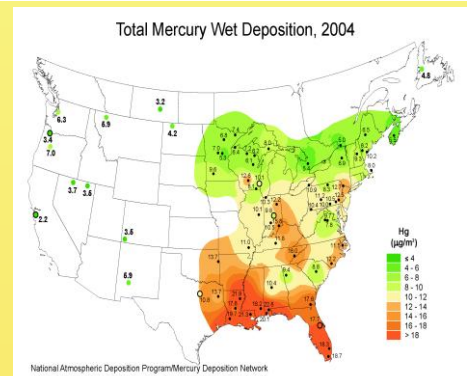
Mercury is less investigated in the west than in the east, in part, because cold-water fisheries which exist in most higher elevation lakes produce trout and salmon, which do not pick up mercury as readily as do warm-water species. However, the dune lakes of coastal Oregon are at low elevation and have had warm-water species introduced, such as yellow perch and largemouth bass. Using these species, it is possible to make comparisons of mercury concentration in fish on the two coasts.



## Measurements of Wet Atmospheric Deposition of Mercury

Mercury deposition is monitored in the United States through the Mercury Deposition Network, a part of the National Atmospheric Deposition Program. These programs result from a collaboration of agencies involved in atmospheric deposition research. Most of the mercury network is located in the eastern part of the United States, so that the background conditions for the country from Pacific Ocean air masses are not well known.

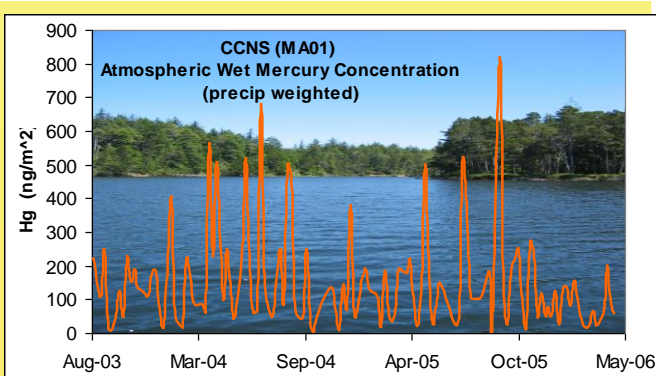
Establishing deposition collectors on the west coast, near the ocean to avoid local sources, is a part of this project.



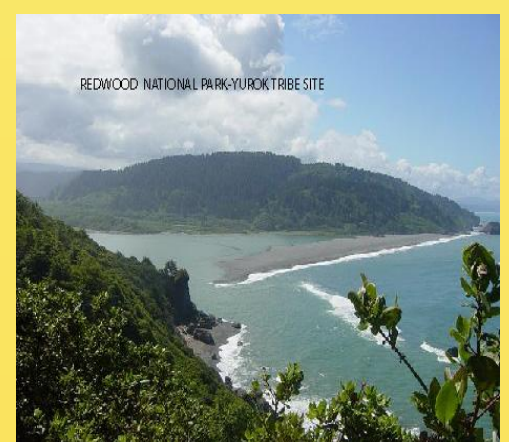
Mercury wet deposition is greatest in the southern part of the country. Few deposition stations exist in the west and none at the latitude of Cape Cod adjacent to the Pacific Ocean.



The mercury wet deposition site for the Cape Cod National Seashore is co-located with additional air monitoring equipment for the National Atmospheric Deposition Program and the Clear Skies Program.



Mercury (precipitation weighted) wet deposition data from Cape Cod NADP/MDN site in Truro for the time period July 2003-April 2006 is depicted above. Indicating a wide variation in concentration throughout the sampling period.

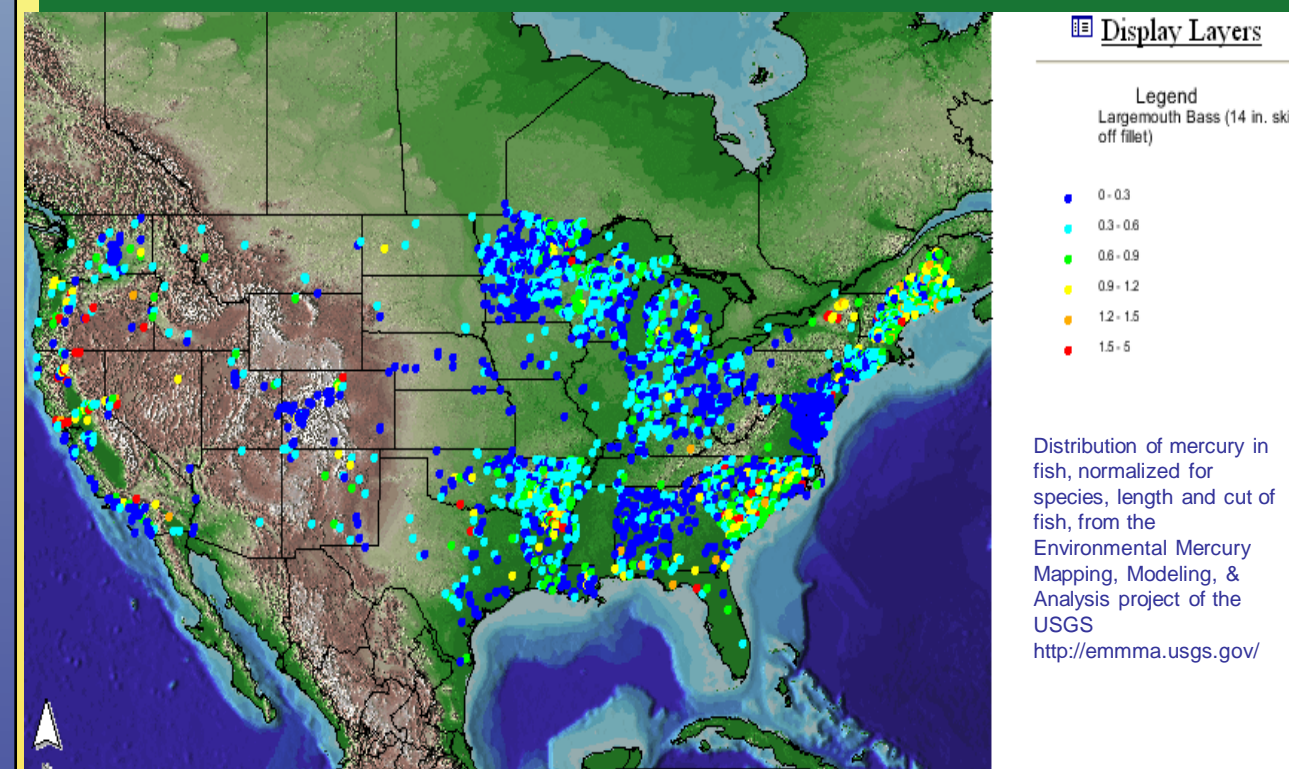


A new site for wet deposition of mercury is being set up in Redwoods National Park just north of the mouth of the Klamath River.

## Central Question: How much would fish concentrations of mercury decrease if local sources of mercury emissions were eliminated in the United States?

Large piscivorous freshwater fish from the lakes of the Cape Cod National Seashore likely contain substantial levels of mercury. High concentrations of mercury have been measured in these kinds of fish throughout New England and it is likely that fish from the lakes of Cape Cod are similarly threatened. Mercury is emitted to the atmosphere from natural and anthropogenic sources such as volcanoes and coal-fired steam plants. The northeast, which is down wind on the continent and which has many local mercury sources, may be particularly vulnerable to the mercury emission sources. The northeast is not the only hot spot for mercury in fish, however, and mapped distributions of mercury in fish do not correspond completely with mapped distributions of mercury in wet deposition. There is a large atmospheric global pool of mercury that may contribute to mercury in fish, even in the absence of local emission sources.

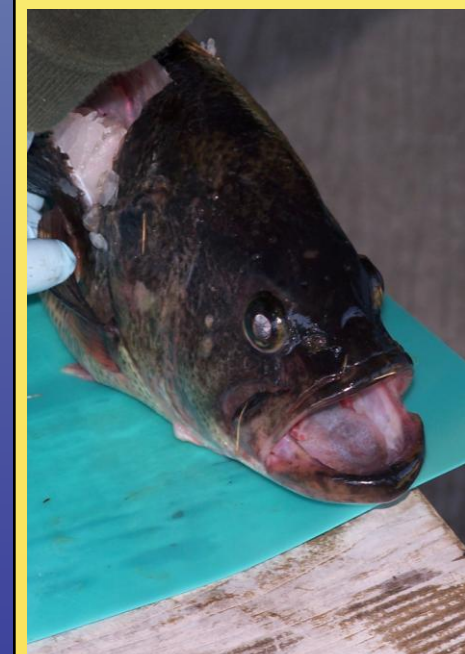
The USGS, in cooperation with the National Park Service, and the State of Massachusetts, are conducting investigations to compare atmospheric deposition of mercury and accumulation of mercury in fish at a down wind location, Cape Cod National Seashore, and upwind locations in Washington, Oregon, and Northern California.



The results of these studies will indicate to what extent mercury concentrations in fish are a result of deposition of mercury from the global atmospheric pool of mercury and to what extent concentrations are attributable to local sources of mercury.

Note: these results and interpretations are based on provisional data are subject to change.

Lake type, chemistry, trophic state, and size should be matched for a meaningful comparison between lakes of mercury in fish. On the east coast, the kettle-hole lakes of the Cape Cod National Seashore were used. On the west coast, dune lakes of coastal Oregon were used. Both lakes sets are low in electrical conductivity, and are oligotrophic. Both lake groups support a characteristic deep growing macroalga, Nitella, which is indicative of clear water.



Large bass like this one from the dune lakes of coastal Oregon are likely to contain mercury if the global pool of atmospheric mercury is important in supplying mercury to fish.



Retrieval of a gill net by personnel from the Massachusetts Department of Environmental Protection for fish collection—mostly yellow perch—at Ryder Pond in the Cape Cod National Seashore, May 2006.